U.S. NUCLEAR REGULATORY COMMISSION

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# REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

## REGULATORY GUIDE 1.101

(The substance of this guidance was issued in a *Federal Register* notice, 68 FR 48673, dated July 24, 2003, concerning proposed amendments to Appendix E to Title 10, Part 50, of the *Code of Federal Regulations*)

# EMERGENCY RESPONSE PLANNING AND PREPAREDNESS FOR NUCLEAR POWER REACTORS

## A. INTRODUCTION

In §50.54, "Conditions of licenses," of Title 10, Part 50, of the *Code of Federal Regulations* (10 CFR Part 50), "Domestic Licensing of Production and Utilization Facilities," paragraph (q) states that, "A licensee authorized to possess and operate a nuclear power reactor shall follow and maintain in effect emergency plans which meet the standards in §50.47(b) and the requirements in Appendix E of this part." Specifically, paragraph IV.F.2.c of Appendix E to 10 CFR Part 50 establishes the following requirements for the training-related content of emergency plans:

> c. Offsite plans for each site shall be exercised biennially with full participation by each offsite authority having a role under the plan. Where the offsite authority has a role under a radiological response plan for more than one site, it shall fully participate in one exercise every 2 years and shall, at least, partially participate in other offsite plan exercises in this period.
>
> If two different licensees whose licensed facilities are located either on the same site or on adjacent, contiguous sites, and that share most of the elements defining co-located licensees, each licensee shall:
>
> (1) conduct an exercise biennially of its onsite emergency plan; and
> (2) participate quadrennially in an offsite biennial full or partial participation exercise; and
> (3) conduct emergency planning activities and interactions in the years between its participation in the offsite full or partial participation exercise with offsite authorities, to test and maintain interface among the affected state and local authorities and the licensee. Co-located licensees shall also participate in emergency preparedness activities and interaction with offsite authorities for the period between exercises.

A footnote to paragraph IV.F.2.c of Appendix E to 10 CFR Part 50 defines "partial participation" as follows:

> "Partial participation" when used in conjunction with emergency preparedness exercises for a particular site means appropriate offsite authorities shall actively take part in the exercise sufficient to test direction and control functions; i.e., (a) protective action decision making related to emergency action levels, and (b) communication capabilities among affected State and local authorities and the licensee.

In addition, a second footnote to paragraph IV.F.2.c of Appendix E to 10 CFR Part 50 defines "co-located licensees" as follows:

> Co-located licensees are two different licensees whose licensed facilities are located either on the same site or on adjacent, contiguous sites, and that share most of the following emergency planning and siting elements:
>
> (a) plume exposure and ingestion emergency planning zones,
> (b) offsite governmental authorities,
> (c) offsite emergency response organizations,
> (d) public notification system, and/or
> (e) emergency facilities.

This regulatory guide provides guidance to co-located licensees and co-located applicants on methods that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for complying with the agency's regulations for emergency response plans and preparedness relative to conducting emergency response planning activities and interactions (A&I) in the years between participation in the offsite full or partial participation exercises with offsite authorities. This regulatory guide does not impose any new positions or requirements. Licensees and applicants are not required to use the methods specified in the regulatory position set forth in this guide, and are free to propose other means to achieve compliance with the applicable regulations.

The information collection activities contained in this regulatory guide increase the burden on co-located licensees to log activities and interactions with offsite agencies during the years that full or partial participation emergency preparedness exercises are not conducted and to prepare a one-time change to procedures to reflect the revised exercises requirements. The public burden for these activities is estimated to average 30 hours per year. Because the burden for these information collection activities is insignificant, clearance by the Office of Management and Budget (OMB) is not required. The existing information collection requirements are covered by the requirements of 10 CFR Part 50, which the OMB approved under OMB control number 3150-0011. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number.

## B. DISCUSSION

In November 1980, the NRC published Revision 1 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,"[1] to provide specific acceptance criteria for complying with the standards set forth in 10 CFR 50.47, "Emergency Plans." The Federal Emergency Management Association (FEMA), the NRC, and other involved Federal agencies use the guidance and acceptance criteria contained in Revision 1 of NUREG-0654/FEMA-REP-1 in their individual and joint reviews of the radiological emergency response plans and preparedness of State and local governments and the plans and preparedness of applicants for and holders of licenses to operate nuclear power reactors. Revisions 2 and 3 of Regulatory Guide 1.101 endorsed Revision 1 of NUREG-0654/FEMA-REP-1.

Then, in January 1992, the Nuclear Utilities Management and Resources Council (NUMARC, now the Nuclear Energy Institute or NEI) issued Revision 2 of NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels [EALs],"[2] which contained guidance on EAL development that accounted for lessons learned from 10 years of using the NUREG-0654 guidance. In Revision 3 of Regulatory Guide 1.101 (August 1992), the NRC stated that Revision 2 of NUMARC/NESP-007 was considered to be an acceptable alternative to the guidance provided in NUREG-0654 for development of EALs to comply with 10 CFR 50.47 and Appendix E to 10 CFR Part 50.

In Revision 3 of Regulatory Guide 1.101, the NRC further stated that "Licensees may use either NUREG 0654/FEMA-REP-1 or NUMARC/NESP-007 in developing their EAL scheme but may not use portions of both methodologies." In addition, in its "Emergency Preparedness Position (EPPOS) No. 1, on Acceptable Deviations from Appendix 1 of NUREG-0654 Based Upon the Staff's Regulatory Analysis of NUMARC/NESP-007, 'Methodology for Development of Emergency Action Levels'," [3] the staff stated that it recognizes that licensees who continue to use EALs based upon NUREG-0654 could benefit from the technical basis for EALs provided in NUMARC/NESP-007. However, the staff also recognized that the classification scheme must remain internally consistent.

In January 2003, the Nuclear Energy Institute submitted NEI 99-01, Revision 4, "Methodology for Development of Emergency Action Levels"[4] to provide guidance for developing EALs that are applicable in the shutdown and refueling modes of plant operations. NEI 99-01 also provided new guidance for developing EALs for permanently shutdown reactors and dry cask spent fuel storage at nuclear power plants. In addition, NEI 99-01incorporated improvements to the EAL guidance in NUMARC/NESP-007; these improvements were first developed (and the rationale behind the revision

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[1] Copies are available at current rates from the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20402-9328 [(202) 512-1800], or from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161 [http://www.ntis.gov, (703) 487-4650]. Copies are available for inspection or copying for a fee from the NRC's Public Document Room (PDR), which is located at 11555 Rockville Pike, Rockville, Maryland; the PDR's mailing address is USNRC PDR, Washington, DC 20555-0001. The PDR can also be reached by telephone at (301) 415-4737 or (800) 397-4205, by fax at (301) 415-3548, and by email to PDR@nrc.gov.

[2] Copies are available for inspection or copying for a fee from the NRC's Public Document Room (PDR), which is located at 11555 Rockville Pike, Rockville, Maryland; the PDR's mailing address is USNRC PDR, Washington, DC 20555-0001. The PDR can also be reached by telephone at (301) 415-4737 or (800) 397-4205, by fax at (301) 415-3548, and by email to PDR@nrc.gov.

[3] Electronic copies are available through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under Accession No. ML022970165.

[4] Electronic copies are available through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under Accession No. ML030300486.

was first discussed) in NEI 97-03, Draft Final Revision 3, "Methodology for Development of Emergency Action Levels," dated December 1998. The NRC did not endorse NEI 97-03 because the staff applied its resources to reviewing NEI 99-01, which incorporates the guidance in NEI 97-03.

Revision 4 of Regulatory Guide 1.101 endorsed the guidance in Revision 4 of NEI 99-01 as acceptable to the NRC staff as an alternative to the method described in Appendix 1 to NUREG-0654/FEMA REP-1 and NUMARC/NESP-007 for developing EALs required in Section IV.B of Appendix E to 10 CFR Part 50 and 10 CFR 50.47 (b)(4).

The purpose of this fifth revision of RG 1.101 is to provide guidance on the conduct of A&I to reflect the provisions of the regulations addressing co-located licensees.

The Commission finds that where two nuclear power plants are licensed to different licensees and meet the definition of being co-located, reasonable assurance of emergency preparedness exists when the following requirements are fulfilled:

(1) Each co-located licensee exercises its onsite emergency plan biennially (once every 2 years);
(2) The offsite authorities exercise their plans biennially; and
(3) The interfaces between offsite plans and the respective onsite plans are exercised biennially in full or partial participation exercises alternating between the two licensees.

Thus, each co-located licensee should participate in a full or partial participation exercise quadrennially. In addition, when one of the co-located licensees is participating in a full or partial participation exercise, the final rule requires any other co-located licensees to participate in A&I with offsite authorities. For the period between exercises, the final rule also requires the licensees to conduct emergency preparedness A&I. The purpose of the A&I would be to test and maintain the interfaces among the affected State and local authorities and the licensees.

Table 1 provides a graphical description of one possible way of meeting the requirements of the regulations.

**Table 1. Example of Emergency Preparedness Training for Two Co-Located Licensees**

| Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Licensee 1 | X | A&I | A&I | A&I | X | A&I | A&I | A&I | X |
| Licensee 2 | A&I | A&I | X | A&I | A&I | A&I | X | A&I | A&I |
| **Notes:** X = Full or partial participation exercise (with appropriate A&I with offsite authorities)<br>A&I = Activities and interactions with offsite authorities | | | | | | | | | |

The substance of this guidance is set forth below:

(1) When one licensee hosts the 2-year full or partial participation exercise, the other licensee is involved in the following activities:
- scenario preparation
- meetings with State and local governmental personnel to develop the extent-of-play document
- training at State and local centers, such as reception centers, congregate care centers, and local emergency operations center
- providing controllers and observers for the full or partial participation exercise

(2) Provide for the staffing of the State and local emergency operations centers (EOC) such as dose assessment and communications personnel as well as the staffing of the Joint News Center.

(3) Conduct hospital drills with alternating localities, if applicable.

(4) Exercise the notification process and EAL scheme.

(5) Exercise the dose assessment methodology and the protective action recommendations methodology for the 10-mile emergency planning zone.

(6) Conduct licensee/offsite training:

- annual State/local training (examples: reactor systems, dry cask storage, EALs)
- licensee-provided fire service training
- licensee-provided ambulance training
- licensee-provided hospital training
- licensee-provided dose assessment training, including dose assessment software

(7) Conduct licensee/offsite meetings and conferences:

- ad hoc meetings with county emergency management staff
- local government emergency planning committee meetings
- license security meetings with offsite law enforcement and other Federal agencies
- licensee assistance in development of the emergency planning public information booklet

(8) Conduct licensee/offsite drills and exercises:

- local and/or State partial participation in licensee drills and biennial exercises
- participation in local/State FEMA-evaluated drill
- local fire department support during licensee onsite fire drills

(9) Licensee/offsite support services:

- licensee provides support at local government reception center training and practice drills
- licensee provides dosimeters and processing services to local government
- licensee provides radiological instrument calibration services to local government
- licensee supports local government during public notification system test
- licensee provides use of weapons firing range to local and state law enforcement (sheriff, State police), if available

## C. REGULATORY POSITION

The criteria and recommendations in this regulatory guide are methods that the NRC staff considers acceptable for complying with the requirements in Appendix E to 10 CFR Part 50 and the planning standards in 10 CFR 50.47(b) that must be met in onsite and offsite emergency response plans. These criteria provide a basis for NRC licensees and State and local governments to develop acceptable radiological emergency plans and improve emergency preparedness.

## D. IMPLEMENTATION

The purpose of this section is to provide information to co-located licensees and applicants regarding the NRC staff plans for using this regulatory guide. Except when a co-located applicant or licensee proposes an acceptable alternative method for complying with specified portions of the agency's regulations, the methods described in this guide will be used in the NRC staff's evaluation of emergency plans and preparedness for co-located licensees.

## REGULATORY ANALYSIS

The NRC staff did not prepare a separate regulatory analysis for this regulatory guide. The staff found it necessary to revise this regulatory guide to ensure consistency with the final rule that amended the regulations in Appendix E to 10 CFR Part 50, as they relate to NRC approval of licensee changes to emergency action levels and exercise requirements for co-located licensees. The regulatory analysis related to that rulemaking appeared in a *Federal Register* notice (68 FR 48673), dated July 24, 2003, which also included the substance of this regulatory guide. That regulatory analysis included the following decision rationale for selection of the proposed action:

> …[T]he additional burdens on a licensee and the NRC are expected to be modest. However, a revision of the requirements is desirable to remove ambiguities in the current regulations, while maintaining safety and reducing unnecessary regulatory burden.

That regulatory analysis is available for inspection and copying (for a fee) at the NRC's Public Document Room (PDR), which is located at 11555 Rockville Pike, Rockville, Maryland. The PDR's mailing address is USNRC PDR, Washington, DC 20555-0001. The PDR can also be reached by telephone at (301) 415-4737 or (800) 397-4205, by fax at (301) 415-3548, and by email to PDR@nrc.gov.

In addition, the NRC staff prepared a separate "Regulatory Analysis for Proposed Revision 4 of Regulatory Guide 1.101 [Draft Regulatory Guide DG-1075] To Accept the Guidance in [Nuclear Energy Institute Standard 99-01] as an Alternative Methodology for the Development of Emergency Action Levels." That regulatory analysis is available electronically through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under Accession No. ML031250542.

# BACKFIT ANALYSIS

This regulatory guide describes a voluntary method that the NRC staff considers acceptable for complying with the amended regulations in Appendix E to 10 CFR Part 50, as they relate to NRC approval of licensee changes to emergency action levels and exercise requirements for co-located licensees. The backfit analysis related to that rulemaking appeared in a *Federal Register* notice (68 FR 48673), dated July 24, 2003, which also included the substance of this regulatory guide. That backfit analysis is available for inspection and copying (for a fee) at the NRC's Public Document Room (PDR), which is located at 11555 Rockville Pike, Rockville, Maryland. The PDR's mailing address is USNRC PDR, Washington, DC 20555-0001. The PDR can also be reached by telephone at (301) 415-4737 or (800) 397-4205, by fax at (301) 415-3548, and by email to PDR@nrc.gov.

Compliance with this regulatory guide is not a requirement, and licensees and applicants may choose this or another method to achieve compliance with these rules. Thus, this regulatory guide does not require a backfit analysis, as described in 10 CFR 50.109(c), because it does not impose a new or amended provision in the NRC's rules, does not present a regulatory staff position that interprets the NRC's rules in a manner that is either new or different from a previous staff position; and does not require the modification of or addition to the systems, structures, components, or design of a facility, or the procedures or organizations required to design, construct, or operate a facility.